

ADEQUACY REPORT – EXECUTIVE SUMMARY

The electricity industry has gone through major changes in structure, shape, and form over the last decade. All signs indicate that business is far from “as usual”. It is prudent at this time to ask if the present approaches can ensure reliable and cost effective supply of electricity over the next two decades and if not, then what is needed to achieve that. This was the prime reason for the formation of the Electricity Advisory Committee (EAC) for which this report was done. The answer to that key question is “no, unless....”. A concise set of recommendations is included in this executive summary but more detailed lists are listed in the report.

Today, the warning signs are here. Fuel transportation, particularly by rail, is congested, and any outage of a rail line wreaks havoc in the system. Coal piles at plants are at all time lows. Most supply and delivery infrastructure is nearing the end of its useful life. Without direction, natural gas demand will grow faster than supply and the capacity of the infrastructure. Spent nuclear fuel storage is reaching capacity without any policy direction on long-term storage or re-processing. Renewables rise and fall with the ebb and flow of congressional activity on subsidies. Transmission is aging and more congested, with further development impeded by an archaic patchwork of cost allocation policies, fragmented permitting practices and endless debate over the “right” project to be build.

The report includes three main chapters assessing generation adequacy, transmission adequacy, and the demand side. The EAC believes that the historical assessment of adequacy based on the demand/resource balance is inadequate to ensure reliable and cost effective service. Therefore, while the report is structured in those three basic chapters, the conclusions are written with a holistic adequacy in mind.

Generation –

The growth of electric generation capacity has continued to decline over the last half century. Industry experts have estimated only a 12.7% growth in capacity over the next ten years to meet a 17.7% peak load growth. New generation is one essential element if we are to maintain adequate reliability of our electric system. To meet this challenge, new policies are required to reduce barriers to entry and promote generation development.

New generation faces considerable uncertainty and risk in today’s environment. Without reducing financial risk and policy uncertainty, generation development is left to those few companies that have sufficient capital resources to stand alone on energy projects. Acquiring project financing, securing long-term output contracts, navigating political and regulatory uncertainty, coping with climate change and environmental issues, managing much higher costs for fuels and new power plant construction, and navigating the siting and interconnection process make the development of new generation a high risk

enterprise. It will be crucial for the new Administration to take actions that help reduce project uncertainties and that foster effective new approaches to securing adequate generation for our energy future.

Each of the various generation types offer significant opportunities for growth and development. Renewable energy, new clean coal technologies, biomass, hydro, nuclear, combined heat and power, natural gas and distributed resources are all required to ensure a reliable and diverse supply portfolio. Policies and directions that support new developing technologies while sustaining historic resource options are vital for lighting our new world's energy future.

Demand-side -

Utilities in many states have been implementing energy efficiency and load management programs (collectively called *demand-side resources*), some for more than two decades. According to one source, U.S. electric utilities spent \$14.7 billion on these programs between 1989 and 1999, an average of \$1.3 billion per year. Since the year 2000, investments in demand-side resources have steadily increased as states that have traditionally offered programs expand their programs and as new states start implementing programs. For example, in 2007 and 2008, 10 states have enacted legislation or regulations setting binding energy savings goals for utilities.

As spending on demand-side programs has grown, so have savings. Cumulative annual savings from electric energy efficiency programs were nearly 90 TWh in 2006, which is 2.4% of total electricity sales to end-users in 2006. Some states are achieving 7-8% or more by this measure, constituting a significant utility resource. Demand response programs (the current name for what used to be called load management) also vary from region to region, with demand response capability in 2008 ranging from a low of about 1.7% of peak demand in ERCOT (Texas) and SPP (primarily Oklahoma and Kansas) to a high of more than 6% in FRCC (Florida) and MRO (upper Plains states). Overall, electric energy efficiency, load management and demand response programs have achieved significant levels of demand savings. For example, EIA estimates that in 2006, these programs collectively reduced peak demand in the U.S. by 27,240 MW, of which 59% came from energy efficiency programs and 41% from load management and demand response programs.

However, while much has been done to promote energy efficiency and demand response, savings to date are only a small fraction of the available resource. For example, a review of 21 different national, regional and state-level studies found that the median achievable efficiency potential calculated in these studies is 18% savings, over about a 13 year period (achievable potential means cost-effective and able to be achieved as a result of policies and programs). The average achievable potential per year of program implementation from these studies is about 1.5%, in line with the most aggressive programs now being implemented and much greater than the approximately 0.2% per year savings that are being achieved on average nationwide. In other words, current

efficiency programs are barely scratching the surface on what is achievable. Similarly, for demand response, recent studies have found that demand response can reduce peak demand by 4-22%, varying as a function of geographic area and key assumptions.

Based on these findings we recommend that DOE and the federal government establish a National Policy to promote sustainable and economically viable energy efficiency and demand response programs. These programs should optimally be designed to maximize cost-effective energy savings, reduce environmental impact of electric infrastructure utilization including end use infrastructure, reduce energy use during peak periods, coordinate with Smart Grid initiatives and enhance the overall reliability of the electric grid.

Transmission -

The existing interstate electric transmission network is the result of actions taken primarily by vertically integrated utilities to build generation and transmission to serve their customers' electricity demands, to provide for the wholesale purchase and sale of electricity with neighboring utilities, and to share generating capacity reserves to minimize installed capacity reserves. This system is now at an age and condition requiring significant replacement of original infrastructure and one that is not robust enough to enable the electricity future projected for the United States. Broad-scale regional and interregional planning and meeting larger national needs was not the goal in planning the current system. Yet this grid system is being called on to meet the needs of wholesale markets that have evolved since the passage of the Energy Policy Act of 1992, and more recently to integrate remote sources of renewable generation.

There are two main reasons why there is a critical need to upgrade our nation's electric transmission grid. First, increasing transmission capability will help ensure a reliable electric supply and provide greater access to economically priced power. Second, the growth in renewable energy development, stimulated in part by state-adopted renewable portfolio standards (RPS) and the possibility of a national RPS, will require significant new transmission to bring these resources, often remotely located, to customer load centers.

Currently, state and federal agencies are responsible for siting and permitting transmission lines in their respective jurisdictions, and often multiple entities with varied processes are involved in the siting of EHV transmission projects. In many cases, each state and federal agency has its own permitting rules and processes which are rarely consistent with each other. The uncoordinated participation of a wide spectrum of interested parties, and the nature of interstate EHV transmission crossing jurisdictional boundaries, complicates and impedes the planning, approval, and permitting processes.

Transmission planning and development must be done in the context of comprehensive demand and resource analysis, to ensure that demand-side resources and environmentally desirable supply-side resource options are fully considered and pursued. Add to this the likelihood of further demand growth due to increased electrification of the transportation

sector and industrial processes as we pursue strategies to reduce society's impact on climate and the environment overall. The nation needs a broad vision for a transmission system that will help meet the goals of energy security, electricity adequacy, and environmental protection. Collaboration among the many various stakeholders will be necessary to make this vision a reality.

At the same time, electricity must remain reasonably priced for customers. Failure to keep electricity rates reasonable will have a damaging impact on the nation's economy and the quality of life for many Americans. Transmission is only a small part of the average customer's electricity bill today, typically less than 10%. Even with cost of significant new and upgraded transmission, a properly planned and developed transmission system can facilitate lower overall costs for transmission dependent utilities (TDUs) and ultimately customers by creating better delivery efficiencies and greater market reach for energy supplies. The development of a more robust electricity transmission grid will certainly require more equipment, material and labor resources at a time when there is a growing global demand. While global market forces may create better supply in the long term, the availability of equipment, material, and labor may be limited and higher cost in the short term.

State, regional, and national priorities, including grid reliability, economic energy supply, energy security, and climate change, can all be addressed through the development of a robust transmission system. The benefits of a robust grid include:

- Access to new generation technologies and the ability to share the benefits of demand response and smart grid initiatives across broad regions.
- Improved system resource adequacy, by allowing greater sharing of resources and less dependence on local generation and constrained fuel supplies.
- Enhanced system reliability, security, and efficiency.
- Increased market competition that will benefit customers by eliminating grid bottlenecks which inflate costs by blocking supply.
- Lower and more stable rates for consumers over the long term through increased access to lower cost resources and a more diverse portfolio of energy sources made accessible through transmission.
- Access to renewables and other low-carbon resources to meet RPS requirements and greenhouse gas (GHG) emission reduction goals.

Recommendations:

Generation

1. Support cost recovery insurance pools, additional renewable development grants and new capacity pricing options to help reduce financial risk for new generation developers;
2. Promote policies, processes and legislation that increase certainty over longer timeframes and help develop long-term purchase power arrangements and new high capacity transmission infrastructure;

3. Advocate a review of national energy planning processes and promoting new approaches that allow market based RTOs to consider and mandate the most economical solutions; [I don't understand this; "market based RTOs?"]
4. Seek longer term certainty for air and water quality requirements and improved grant and loan programs to stimulate new clean technologies; and
5. Promote greater regional coordination and planning of what?, including the potential to re-establish regional offices [for what? Doe?] and provide grants to whom? to support regional energy planning efforts
6. Support the development of renewable and distributed generation to help reduce system losses and contribute to system reliability.

Demand Side Resources

7. Develop National Measurement and Verification Protocols/Standards that will better measure the energy efficiency savings that are being achieved, so that these savings can be more reliably counted upon to be a substitute for some new power plant construction, and to better ensure that demand-side investments are cost-effective.
8. Place priority on expanding existing DOE programs that capture energy efficiency savings (e.g. updating Federal Appliance/Equipment Standards and national model building codes) and that help develop new energy-saving technologies that can be used in future decades (i.e., DOE's research and development initiatives).
9. Promote at the federal and state levels policies that can encourage expanded energy efficiency and load management efforts including:
 - i. utility business models and rate setting approaches that encourage and reward cost-effective energy-efficiency investments while providing a substantial majority of benefits to ratepayers;
 - ii. expanded federal technical assistance to states and utilities;
 - iii. allowing Demand Resources to participate in ISO Forward Capacity Markets;
 - iv. enacting binding (?) energy savings targets for utilities to meet that are based on sound analysis of cost-effective opportunities and that fairly treat each customer class

Transmission

10. DOE should seek the development of comprehensive and long-term interregional planning efforts, one for the Eastern US interconnection grid and another for the Western US interconnection grid. These efforts should include full consideration of demand- and supply-side options, "technology neutral" analyses, adequate assessment of environmental impacts (including GHG emissions), full support for

renewable development, robust planning horizons, and full consideration of electrification of transportation elements and industrial processes for our energy future.

11. The majority of the DOE Electricity Advisory Committee (EAC) recommends a sole federal authority for permitting EHV interstate transmission approved by appropriate planning authorities, particularly transmission to interconnect and integrate low-carbon resources. If not a sole federal authority for permitting these lines, NIETCs should be expanded to include transmission for the interconnection and integration of low-carbon resources.
12. FERC should lead in the development of broad cost allocation for extra-high voltage regional and interregional interstate transmission facilities that have broad benefits across interconnected grids.
13. DOE should expand research into: (i) wide-area monitoring and control initiatives, (ii) network integration of renewable resources, and (iii) control center enhancements needed for grid security and our energy future.
14. DOE and FERC should support reduced barriers for transmission investment and new transmission ownership structures, while ensuring that reliability is not jeopardized.